Challenge TB - BURMA

Year 2

Annual Report

October 1, 2015 – September 30, 2016

November 8, 2016

Cover photo: Dr. Win Maung, former Director of Disease Control and currently working at the World Health Organization (WHO), actively discussing partner activities during the Partner's meeting, which is important for implementing sub-grant activities from the Challenge-TB Project in Burma.

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List of Abbreviations and Acronyms

1	**3MDG**	The Three Millennium Development Goal Fund
2	**ACF**	Active Case Finding
3	**AFB**	Acid-Fast Bacilli
4	**AIDS**	Acquired Immune Deficiency Syndrome
5	**BSC**	Biosafety Cabinet
6	**BSL3**	Biosafety Level 3
7	**CAPTB**	Control and Prevention of Tuberculosis
8	**CTB**	Challenge TB
9	**DOTS**	Directly Observed Treatment – Short course
10	**DST**	Drug Sensitivity Test
11	**FIND**	Foundation for Innovative New Diagnostics
12	**GF**	The Global Fund to fight AIDS, Tuberculosis and Malaria
13	**GLI**	Global Laboratory Initiative
14	**GUV**	Germicidal Ultraviolet
15	**HCW**	Health Care Worker
16	**HIV**	Human Immunodeficiency Virus
17	**IDP**	Internally Displaced Persons
18	**KDHW**	Karen Department of Health and Welfare
19	**LQMS**	Laboratory Quality Management System
20	**LTO**	Laboratory Technical Officer
21	**MDR-TB**	Multidrug-resistant Tuberculosis
22	**MGIT**	Mycobacteria Growth Indicator Tube
23	**MMA**	Myanmar Medical Association
24	**MOHS**	Ministry of Health and Sports
25	**NAP**	National AIDS Programme
26	**NFM**	New Funding Model
27	**NSP**	National Strategic Plan
28	**NGO**	Non-governmental Organization
29	**NTP**	National TB Programme
30	**NTRL**	National TB Reference Laboratory
31	**PLHIV**	People Living with HIV
32	**PMDT**	Programmatic Management of Drug-resistant Tuberculosis
33	**PPM**	Public-public or Public-private Mix
34	**PR**	Principal Recipient
35	**PSI**	Population Services International
36	**SCI**	Save the Children International
37	**SOP**	Standard Operating Procedure
38	**STTA**	Short-term Technical Assistance
39	**TB**	Tuberculosis
40	**ToT**	Training of Trainers
41	**TRP**	Technical Review Panel
42	**UNOPS**	United Nations Offices for Project Services
43	**WHO**	World Health Organisation

1. Executive Summary

Burma (Myanmar), listed as one of the new High Burden Countries for TB, TB/HIV and MDR-TB, is implementing the MOHS-led TB control and prevention system, which is primarily coordinated by the National TB Programme under the Director of Disease Control. In Burma, there are 47 district TB teams in 70 districts, and 119 township TB teams out of a total of 330 townships in Burma (65 teams are led by medical doctors and 54 by health assistants). The remaining townships (211) have either a trained TB coordinator from the general health services or one dedicated TB staff.

Diagnosis of TB is primarily based on direct sputum smear microscopy and there are 3 culture facilities in Burma (Yangon, Mandalay and Taunggyi, the former 2 having DST facilities). GeneXpert has been scaled up in the country with 52 machines being installed and used across the country to date. TB case finding is done mainly by the NTP with support from local and international NGOs funded through GF and 3MDG. Among 140,700 TB cases notified in 2015, 79.3% were identified through NTP activities while 20.7% were identified through partner led TB case finding. PPM activities were implemented at 24 public hospitals through which 2443 general practitioners registered under PPM-DOTS. By the end of 2015, Burma scaled-up MDR-TB diagnosis and treatment to 108 townships, with 2793 cases notified and 2207 cases put on MDR-TB treatment. During this same timeframe, an increase in collaboration between NTP and National AIDS Programme led to TB/HIV collaborated activities in all townships. In addition, the treatment success rate for drug-sensitive TB was 85% in 2015 and 83% for those in MDR-TB treatment in the same year (2013 cohort).

The overarching focus of Challenge TB Project in Burma (CTB-Burma) is to actively find and effectively treat missing TB cases by enrolling patients into TB prevention and care. In 2014, an estimated 50,000 TB cases were missed or not identified. In order to rapidly reduce TB transmission in the country and further reduce the epidemic, CTB-Burma focuses on strengthen TB Prevention and Treatment efforts by addressing three areas: reaching the hard to reach, strengthening the TB diagnostic network, and strengthening the NTP in analysis of, and strategic planning for, intervention strategies. CTB-Burma works to expand the diagnosis of TB and MDR-TB throughout the country, maintain high treatment success rates throughout Burma, and to increase treatment success rates in areas where treatment success rates are currently low. CTB-Burma activities were mainly technical assistance to the NTP and TB stakeholders in APA2.

Although there were many APA2 activities planned, CTB-Burma was unable to implement some activities because 1) NTP prioritized working on the National Strategic Plan and Global Fund Concept Note during APA2, and 2) complicated approval processes between the CTB office in Yangon and NTP central office in Nay Pyi Taw

The most important accomplishments from APA2 are:

a. The PPM National Situational Analysis was finalized in APA2. Recommendations from the PPM Analysis focused on comprehensive engagement of the NTP with PPM stakeholders and partners, including drug sellers.
b. CTB provided access to high-quality diagnostics through STTA by laboratory expert Kathleen England, as well as LQMS introduction and biosafety officer training, GeneXpert trainings based on the GLI package, and hiring a Senior Laboratory Technical Advisor Natalia Shubladze to oversee culture and DST activities at NTRL.
c. The Cover Your Cough Campaign was conducted with school children in 20 schools in 4 townships in the Yangon Region. The campaign has been so successful it is continuing until now. At the time of reporting the campaign has reached 15,890 students (as of September 30). The campaign has successfully raised awareness about TB among the staff such that the teachers are highly motivated and collaborative, and the students are actively participating. A post survey will be done on completion to document success.

d. Childhood TB prevention and care practice has been improved across Myanmar through providing funding to review and update the childhood TB guidelines.
e. CTB engaged with Karen Department of Health and Welfare (KDHW and provided TB trainings to 77 community health personals from KDHW. These trainings focused on how to identify presumptive TB cases for early referral and diagnosis within the communities they serve.
f. CTB contributed to the revision and update of the TB Infection Control Guidelines. CTB also provided training for trainers on these guidelines to 36 NTP officials, who will subsequently cascade these trainings in all states and regions in APA3. CTB Burma also supported the GF and 3MDG projects by advising on infection control related issues such as building layout, floor plan and construction design, equipment maintenance and GUV procurement and installation.
g. CTB was a key contributor in the development, publication and dissemination of the National TB Strategic Plan (2016-2020) (together with operational plan and concise version), National Monitoring and Evaluation Plan for TB Control (2016-2020) and National TB Spending Assessment (2011-2014), which will guide the country's TB activities for the next 5 years.
h. A top priority during APA2 for the NTP was finalizing the Global Fund Concept Note, which CTB successfully provided technically guidance on, such as conducting a financial gap analysis, determining available domestic and international funding, and hiring a lead consultant to write the GF Concept Note to address TRP comments.
i. CTB sent NTP staff to international conference and trainings (UNION Conference in Cape Town, Lab training in The Hague, TIME Modelling training, MDR-TB Clinical Management training) so NTP staff can further enhance their technical knowledge on TB control activities, diagnostics, programmatic planning, and cost analysis which has help NTP plan prioritize interventions and clinical management efforts across Burma, leading to major positive impacts focused on TB control activities across Burma.

2. Introduction

In 2015, WHO released the new High Burden Country (HBC) lists for TB, TB/HIV and MDR-TB, of 30 countries ("20+10") each, which will be used by WHO for five years from 2016–2020. Burma is one of fourteen countries listed in the top 20 list of each; TB, TB/HIV and MDR-TB, when calculated by estimated absolute number. [1]

Table 1. Impact indicators at National level 2010-2014

CTB Impact Indicators (WHO Global TB Report 2015)	2010	2011	2012	2013	2014
TB incidence rate/100,000 (all forms, includes PLHIV)	384	380	376	373	369
TB mortality rate/100,000 *excluding* PLHIV	53	51	50	51	53
TB mortality rate/100,000 *among* PLHIV	12	10	9.4	7.9	7.7
Proportion of RR-TB and MDR-TB cases among all notified pulmonary TB cases (both new and retreatment)[2]	4.2% (new) 10% (retreatment	4.2% (new) 10% (retreatment	4.2% (new) 10% (retreatment	5% (new) 27% (retreatment	5% (new) 27% (retreatment

Source: http://www.who.int/tb/country/data/download/en/

Overview of NTP in Burma

Currently, the MOHS-led TB control and prevention system starts at the Program Manager with the rank of Deputy Director leading the NTP and reporting to the Director of Disease Control. To address the TB epidemic in Burma, this manager plays a key coordinating role in all TB activities and interventions. The NTP operates in Nay Pyi Taw Union Territory and 14 states and regions, with TB centers headed by state/regional TB officers. There are 47 district TB teams in the 70 districts, and 119 township TB teams (65 teams led by medical doctors and 54 by health assistants) out of 330 townships. The remaining townships (211) have either a trained TB coordinator from the general health services or one dedicated TB staff. At the Rural Health Center (RHC) level, TB control activities are implemented by basic health staff. Basic health staff at rural/urban Health Centers and sub-centers deliver the majority of TB care and prevention services for both drug-sensitive and MDR-TB; this work is also supported by midwives. With the separation of Department of Health into Department of Public Health and Department of Medical Care, there were many vacant posts that appeared, indicating the gap for NTP human resources for TB control activities. While many previously vacant posts have been filled,

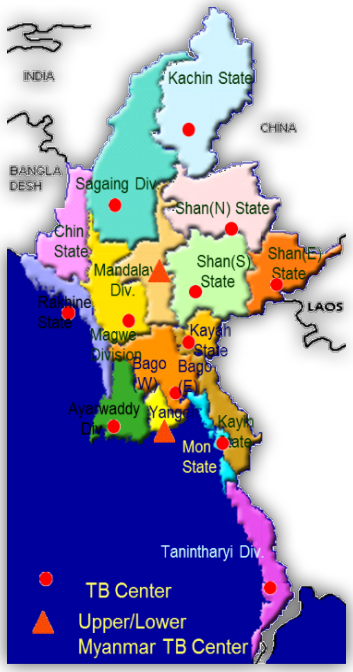
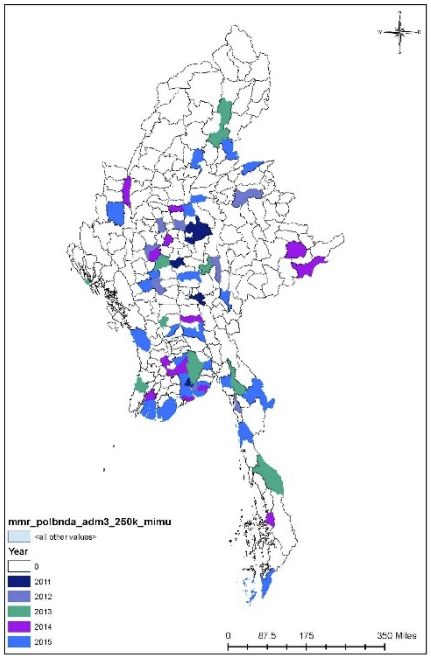


Figure 1: Location of TB Centres and Regional Offices for TB Control

[1] Use of high burden country lists for TB by WHO in the post-2015 era, STAG-TB, WHO 2015
[2] Drug Resistance Surveys (2010) and (2013), National TB Program

some key posts are still vacant (e.g. Six state/region TB officers, 10 medical officer team leaders, 10 Grade I lab technicians, 104 Grade II lab technicians, etc.).

TB control activities in Burma



The diagnosis of TB is primarily based on direct sputum smear microscopy using binocular conventional light or fluorescence microscopes. By the end of 2014, MDR-TB diagnosis, treatment, and care services were scaled up to 68 townships. The new technology for rapid diagnosis of rifampicin resistance, Xpert MTB/RIF also known as GeneXpert, was introduced and by the end of 2014 52 sites, mainly at Region/State and District TB centres, were using GeneXpert machines. By the end of 2014, the External Quality Assurance System (EQAS) for sputum microscopy was in place in 514 public and private laboratories.

The NTP uses Fixed Dose Combinations (FDC) of first-line anti-TB drugs since 2004 and started using patient kits in April 2010, as per WHO recommended treatment guidelines. The Basic Health Staff members (BHS) closely supervise TB patients to take anti-TB drugs. The National Drug-resistant Tuberculosis (DR-TB) Expert Committee was established in September 2006 and a pilot project for the management of MDR-TB began in July 2009, embedded within the existing TB control programme. The project was carried out in 10 selected townships in Yangon and Mandalay Regions with the approval of Green Light Committee (GLC) and in close collaboration with WHO and Médecins sans Frontières-Holland (MSF-H) with the support of UNITAID. Following the project's great success, the pilot project was mainstreamed and expanded to 22 townships in Yangon and Mandalay regions in 2011 with the support of the Global Fund with the long-term goals of diagnosing MDR-TB in all groups of patients at risk for MDR-TB (including TB/HIV co-infected patients) as well as for treatment of all diagnosed MDR-TB patients under WHO-endorsed treatment protocols. By the end of 2015, MDR-TB diagnosis, treatment and care services were scaled up to 108 townships, with 2793 cases notified and 2207 cases put on MDR-TB treatment.

Figure 2: MDR TB Township scaling up between 2013 and 2015

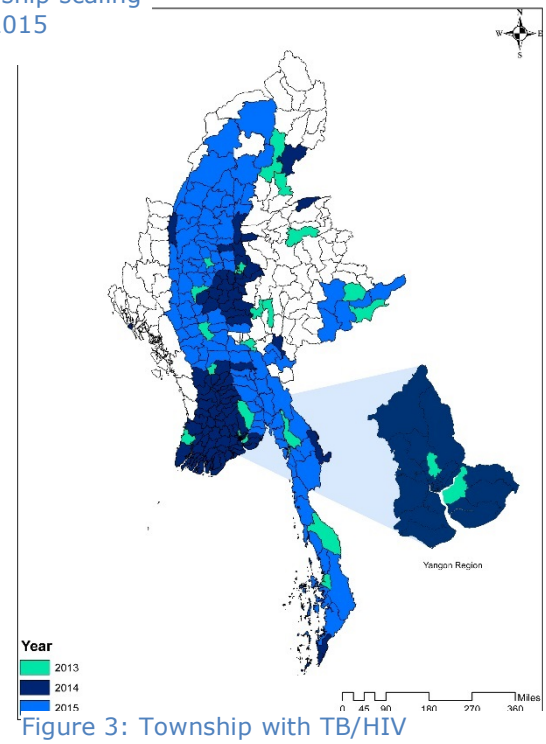


Figure 3: Township with TB/HIV Collaborated activities (2015)

TB/HIV collaborative activities have been led by the National TB/HIV coordinating body, which was formed in 2005 and re-organized in 2012. TB/HIV collaborative activities begun in seven townships in 2005 and expanded to all 330 townships in 2016. HIV sentinel surveillance (HSS) among new TB patients begun in 5 townships in 2005 under the surveillance system of National AIDS Programme (NAP). The HSS townships are gradually expanded and are up to 28 in 2014. The HIV

prevalence among new TB patients was 8.5% in 2014.

The Public-Public Mix DOTS activities have been implemented in four public general hospitals since 2007 with support from the Three Diseases Fund (3DF). The Global Fund has supported PPM DOTS activities since 2011, and NTP scaled up PPM DOTS activities to 24 public hospitals in 2015. The Public-Private Mix DOTS activities have also been in place since 2004 in collaboration with NTP, Myanmar Medical Association (MMA), and Population Services International (PSI), in 230 townships across the country. Overall, 2443 general practitioners were registered in PPM-DOTS (any scheme) in 2015.

Community-based TB care activities have been implemented by four local non-governmental organizations (NGOs) and six international NGOs since 2011 with the support of the Global Fund. In 2014, the Three Millennium Development Goals Fund (3MDG) also funded community-based TB care activities through international NGOs – Asian Harm Reduction Network (AHRN), Medical Action Myanmar (MAM), PSI, the International Union Against Tuberculosis and Lung Disease (Union); and local NGOs – MMA and the Myanmar Health Assistants Association (MHAA).

Challenge TB Project in Burma

The overarching focus for the Challenge TB Project (CTB) in Burma is to actively find and effectively treat the missing TB cases and get them into the system of TB prevention and care. It is estimated that nearly 50,000 of the incident TB cases in 2014 were not identified and registered to start treatment. In order to more rapidly reduce TB transmission in the country and further reduce the epidemic, the focus of CTB in Burma is to plane strengthening TB Prevention and Treatment efforts by focusing primarily on three main areas: i) Reaching the Hard to Reach, ii) Strengthening the TB Diagnostic network, and iii) strengthening the NTP in analysis of strategic planning for, novel intervention strategies. These activities would build on the successes of the CAP-TB project, to extend the diagnosis of TB and MDR-TB throughout the country, and to maintain high treatment success rates and to increase treatment success rates in areas where they are low.

CTB during APA2 worked mainly at the national and regional levels for various technical areas. The main activities included technical assistance to the NTP for implementing its TB control activities in novel and innovative ways regarding diagnosis, treatment, retention in care, TB/HIV collaboration and inter-departmental and inter-ministerial collaboration and policy development.

Although there were many APA2 activities planned, CTB-Burma was unable to implement some activities because 1) NTP's prioritized the National Strategic Plan and Global Fund Concept Note, and 2) the problem of having the CTB office in Yangon while the NTP central office is in Nay Pyi Taw, which prevented day-to-day contact and significant delays in approval of an activity.

Challenge TB Burma intervention areas for the second year of the project included the following-

1. Enabling Environment,
2. Comprehensive - High Quality Diagnostics,
3. Patient Centered Care and Treatment, Prevention,
4. Targeted Screening for active TB,
5. Infection Control (IC),
6. Political Commitment and Leadership,
7. Comprehensive Partnerships and Community involvement,
8. Drug and Commodity management, and
9. Quality Data-Surveillance and Monitoring and Evaluation (M&E).

The most important accomplishments from APA2 are:

a. The PPM National Situational Analysis was finalized. Recommendations from the PPM Analysis focused on comprehensive engagement of the NTP with PPM stakeholders and partners, including drug sellers.
b. CTB provided access to high-quality diagnostics through STTA by laboratory expert Kathleen England, as well as LQMS introduction and biosafety officer training, GeneXpert trainings based on the GLI package, and hiring a Senior Laboratory Technical Advisor Natalia Shubladze to oversee culture and DST activities at NTRL.
c. The "Cover Your Cough" Campaign was conducted with school children in 20 schools in 4 townships in the Yangon Region. Being so successful, the campaign is still going-on. At the time of reporting (8-10-2016) the campaign has reached 15,890 students (as of September 30). The campaign is successfully raising awareness about TB and cough etiquette among school children and their families.
d. Childhood TB prevention and care practice has been improved across Myanmar through providing funding to review and update the childhood TB guideline.
e. CTB engaged with KDHW and provided TB trainings to 77 community health personals from KDHW. These trainings focused on how to identify presumptive TB cases for early referral and diagnosis within the communities they serve.
f. CTB contributed to the revising and updating of the TB Infection Control Guidelines. It also provided training or trainers on these guidelines to 36 NTP officials, who will subsequently cascade these trainings in all states and regions in APA3. CTB Burma also supported the GF and 3MDG projects by advising on infection control related issues such as building layout, floor plan and construction design, equipment maintenance and GUV procurement and installation.
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3. Country Achievements by Objective/Sub-Objective

Objective 1. Improved Access

Sub-objective 1. Enabling environment

Challenge TB focuses on areas of PPM and population level advocacy and communication under sub-objective 1. CTB focused on assisting the National TB program with implementing service provisions according to national guidelines for all care providers, and to extend services to all risk groups. CTB focused on drug seller, prison, and public and private hospitals DOTS engagement strategies under PPM intervention. In APA1, CTB conducted a PPM National Situational Analysis (NSA) collaborating with NTP, implementing partners and private sectors, which was finalized and submitted in APA2 (April, 2016). In APA2, CTB also worked to improve community empowerment through a population level media campaign titled Cover Your Cough Campaign 2016. This campaign is still being conducted in collaboration with National TB Program, School Health (Ministry of Health and Sports) and Department of Basic Education (Ministry of Education).

Key Results

- CTB finalized the PPM NSA, which included recommendations to the NTP, PPM stakeholders and partners. One of the important recommendations made by PPM NSA is in the areas of drug sellers interventions. CTB focused on drug stores around the country because these stores are the first line providers of medicines to patients. In order to cope with the missing cases of various townships and urban areas, CTB is planning to collaborate with PPM partner to roll out a drug seller intervention in APA3.
- Under the PPM interventions, CTB discussed with PPM stakeholders such as NTP, Myanmar Private Hospital Association (MPHA), PSI and MMA. NTP is the key stakeholder to implement the engagement of public hospitals across the country. NTP, a public body to engage public hospitals, under the different department (public hospital is under the management of Department of Medical Care), has some challenges in terms of recording and reporting in TB care as the capacity of NTP (Human Resource) is limited to support that.. As a result of discussion with PPM stakeholders, all of them came to understand the need of collaboration for next step. It was also agreed that a separate meeting will be held for better PPM engagement.
  In order to facilitate the hospital engagement in both public and private sectors, CTB continued discussing and planned to organize a meeting to discuss the strategic plan for faster PPM hospital engagement and to support follow up activities in APA3.
- CTB participated in a series of stakeholder meeting organized by International Committee of the Red Cross (ICRC) together with other stakeholders regarding health in prisons. Apart from NTP, ICRC is the only organization that could access to prisons because they have an MOU with the Ministry of Home affairs, NTP recommended CTB to engage with them. CTB explored the possibility of holding symposium on health in prisons with prison authorities and prison working group during APA 2. Because of the country political situation in election period, it was not the priority for NTP as well as not from the prison side.
- During APA2, CTB focused on roll-out and engagement of the Cover your Cough Campaign. Results included:
  - Engaging officials from Ministry of Health and Sports and Ministry of Education to conduct the campaign in 20 schools in 4 townships across Yangon Region.

- Organizing campaign advocacy meetings with stakeholders from the Central and Regional Public Health Department, school health teams, Basic Education Departments, school headmasters, and teachers.

As of 30th September 2016, Cover Your Cough Campaign team has reached 15,890 students (planned 21,198). The campaign evaluation will be done after the campaign has been completed.

#	Outcome Indicators	Baseline (Year/ timeframe)	Target	Result
			Y2	Y2
1.1.1	% of notified TB cases, all forms, contributed by non-NTP providers (i.e. private/non-governmental facilities)	22.4% (2014) 31,798/141957	23% 35,236/153,200	20% 28,140/140,700
1.1.1	Number and percent of cases notified by setting (i.e. private sector, pharmacies, prisons, etc.) and/or population (i.e. gender, children, miners, urban slums, etc.) and/or case finding approach	141,957	153,200	140,700
1.2.2.	% of (population) with correct knowledge and positive attitudes towards people affected by TB	TBD	TBD	Not available

Sub-objective 2. Comprehensive, high quality diagnostics

Burma's five-year strategy to strengthen the laboratory network is to develop a comprehensive approach focused on improving quality throughout the laboratory network. Initial efforts aimed at strengthening the capacity and skills in the national level laboratories focused on improving culture and DST methodologies for Second line drugs (SLD) including both molecular and phenotypic methods and helping to assure that appropriate diagnostic algorithms are adopted.

Key Results

During APA2 Dr. Kathleen England provided technical assistance to laboratories focusing on culture and DST for 2nd line drugs at both upper and lower Myanmar Reference laboratories. On this visit the consultant provided an step-by-step overview of 2nd-line MGIT DST which included drug calculations and preparations. Upon observations of current practices and protocols for both solid and liquid methods for cDST, the consultant provided the areas need to improve and efficiencies in the performance and quality of testing. In addition, there were several questions raised regarding general lab practices, biosafety, and the update and accuracy of current protocols used within drug-susceptibility testing.

Additional, trainings provided included:

- A review of Biosafety for TB containment laboratories (with practical)
- A review of protocols and practices require for 2nd-line cDST by MGIT (with in laboratory mentoring)
- An introduction to new molecular technologies including whole genome sequencing.
- Updates on current WHO recommended diagnostics and upcoming Cepheid products
- An overview of Quality Performance Indicators for TB laboratories and their importance in monitoring and auditing lab testing.

In addition, the consultant visited the Taunggyi Reference lab to follow-up from the previous mission and assess the developments toward establishing routine culture solid culture testing and the progress on the lab new Containment lab construction. During this visit, information was also gathered to map Specimen referral and access to testing from the facility registers. The CTB LTO is currently performing a network review of STS and access for all Xpert and culture laboratories.

The outcome of this TA provided a list of actions and recommendation for the program to review and discuss as ways forward to improving c/DST activities and speed-up the implementation of 2^{nd}-line DST. Finally, the program agreed that it was necessary to second a full-time lab advisor to assist the NRL and upper Myanmar lab with improving their diagnostic testing program, ensuring biosafety, updating SOPs and general practices, and guiding the lab through the implementation of quality management systems to improve the quality of diagnostic services.

Access to quality culture/DST ensured

In March 2016, Dr. Kathleen England provided technical assistance, mentoring and training on2^{nd} –line cDST, diagnostic updates for molecular technologies used for identifying DRTB, TB containment laboratory biosafety, and the use of quality performance indicators to monitor laboratory testing. After this training, and due to the outcome of her debrief with the NTP Manager and the Director of Disease Control, a request was made for CTB to provide day-to-day TA and mentor at NTRL. Prior to hiring a Senior TB laboratory advisor full time, the project brought the consultant (Dr. Natalia Shubladze) on a one-month consultancy to ensure the consultant would integrate well with the NTRL staff and that her qualifications were satisfactory for the program needs.

During the mission, the consultant focused on the some of the areas that were identified from the past TA visit:

1) Supporting establishment of quality assured testing for all methods implemented in laboratory (excluding microscopy).
2) Initiate review laboratory protocols and SOPs and support revision in accordance with international standards.
3) Review and strengthen bio-safety practices

The report of this one-month consultancy was shared with NTP and partners in August, 2016. Because of her quality performance during the one-month consultancy, CTB hired Dr. Natalia Shubladze to provide the necessary TA and mentor at NTRL starting from August, 2016.

Laboratory Technical Officer (LTO) from CTB Burma Project was trained for 3 weeks at Supra-National Laboratory (SNRL, Institute of Tropical Medicine (ITM) Antwerp, Belgium). The LTO d was provided technical training on all the current WHO recommended diagnostics methods. Priority was given to developing knowledge with regard to phenotypic and genotypic drug susceptibility testing in order to better support the Myanmar NTRL and gain the needed credentials to assimilate into the laboratory team. The was provided technical training on current WHO recommended. Priority was given to developing knowledge with regard to and gain the needed credentials to assimilate into the laboratory team. CTB also supported 3 NTP staff to attend the Challenge TB Laboratory Capacity Building Workshop in The Hague, Netherlands. The Project Management Unit (PMU) of Challenge TB organized a 6-day workshop for Challenge TB Laboratory Capacity Building in late June 2016. The workshop took place at the KNCV office in The Hague, Netherlands. The workshop was focused on key priorities for TB laboratory networks in CTB countries. After coming back to Myanmar, the NTP participants shared the knowledge from the workshop with the Director of Disease Control and NTP manager. From the feedback of the workshop, the program decided to move forward with the LQMS advocacy meeting which was also conducted in APA2.

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Introduction to LQMS

In APA2, CTB-Burma conducted a workshop titled "Advocacy Workshop to introduce the Laboratory Quality Management System (LQMS)" in Nay Pyi Taw on 12th September 2016. The objective of this workshop was to orient the program about the LQMS process for continuous quality improvement in laboratories and to examine how to implement the LQMS across Myanmar according to the ISO 15189 International Quality Standard for Medical Laboratories. There were 16 participants in the workshop (11 females and 5 males). The workshop addressed the following questions:

1. Why do we need laboratories?
2. Why do they need to be strengthened?
3. What is quality?
4. What is a quality management system?
5. How to implement a quality management system?
6. What is the price?
7. Global perspective
8. How can Challenge TB help?

As a result of this meeting, CTB is planning to provide TA to implement the LQMS to the TB network across Burma, which will help to improve the quality of laboratory services in TB control. Implementation of LQMS will be planned for APA3.

Figure 4: Active discussion and group photo at Advocacy Meeting to Introduce the LQMS

Strengthen laboratory capacity for use of GeneXpert

CTB-Burma conducted the "TOT for GeneXpert based on GLI training package" training in Yangon from 22nd August – 25th August 2016 and in Mandalay from 29th August – 1st September 2016. There were 32 participants in Mandalay (18 females and 14 males) and 26 participants (20 females and 6 males).

The training covered the following topics:

1. FIND and its validation studies on GeneXpert, WHO Policy
2. Laboratory diagnosis of TB and Essential requirements for GeneXpert lab
3. GeneXpert® technology
4. GeneXpert Installation, Calibration (Xpert check), Maintenance, troubleshooting and services
5. Updates on Cepheid (Xpert Ultra and Xpert Omni)
6. Current situation of GeneXpert and error reporting
7. Impact of GxAlert

Figure 5: TOT for GeneXpert based on GLI training package

As a result of this training, the participants were enriched with the innovative updates and came to understand the basics of GeneXpert maintenance regularly and minor troubleshooting.Authorized service providers (ASP) participated in the training and there was a general discussion among NTP, end-user technicians with the ASP on troubleshooting. CTB plan to do follow up performance review in first quarter of APA3.

Sputum transport system (STS)

In order to support the current specimen transportation activities, CTB developed as requested a bilingual Specimen Referral Survey form. This survey was administered duringduring the GeneXpert TOT training to gather information regarding the current status of specimen transportation within Myanmar Xpert Network. However, without their supervisor's assistance, assistance, participants were not able to complete the survey as they could not provide specific dat. Therefore, alternative approaches will be developed to gain a better understanding of the STS within Myanmar and the current challenges faced.

fhi360 Xpert Site : Specimen Referral Survey — CHALLENGE TB — version 1.0

Site Location ______ *Date of Survey*: ______ *Name of Surveyor* ______

	Please answer the below questions with the best available information. If you are not able to answer the question please explain in the comments section.	*Provide the most recent data*	*Comments*	*Instructions*
1)	Number of Health Centers sending specimens to your facility (fill in the attached form)			*(These include private and public sector clinics, traditional healers, midwives, drug sellers, CTB organizations, microscopy centers, etc..)*
2)	Actual # patients receiving Xpert testing in catchment area last year			*(This information will need to be recoved from data records according to priority categories for testing. If GxAlert is install, then this data is available in quarterly and annual reports to the data managers)*
	-Actual # presumptive MDRTB			
	-Actual # HIV+/presumptive for TB			
	-Actual # presumptive Child TB			
	-Actual # presumptive EPTB			
3)	Specimen intake per month (average #) = Utilization rate			*(provide a description of what form of specimen referral is available to you currently. Calculate the percentage in total)*
4)	Currently used modalities for specimen transport	Y/N (%)		
	patient walks to facility with specimen			
	specimen transported by BHS (car or motor bike or bicycle)			
	Specimen sent by partner courier service			
	Specimen sent via local transport system (bus, commercial airlines, etc) to pick-up site			
	Other			
5)	Current information regarding specimens referred for Xpert			
a)	Distance to Xpert			

Figure 6: Bilingual Survey form: Specimen Referral to GeneXpert Sites developed by CTB Lab Technical Officer

Supporting Bio-safety Measures in new and existing laboratories

During APA2, an Infection Control consultant, Dr. Max Meis provided TA to assess the current situation with engineering controls for bio-safety at the NTRL. During previous missions by Kathleen England there were several questions raised as to the functionality of the BSCs and the overall airflow within the lab. Thus, the IC consultant assessed the negative pressure the negative pressure system installed by the Nature Green Innovative (NGI), Thailand and the functionality of the BSC within the laboratory. From this visit it was noted that the BSCs needed proper certification and the containment lab needed proper doors to ensure the TB containment lab was under negative pressure and had the appropriate conditions for a safe working environment. After the consultant visit, CTB provided funding for the renovation of the doors of the BSL 3 lab to maintain negative pressure Moreover, CTB plans to bring in qualified external assistance (for example SRL Gauting) to provide BSC certification training.

Figure 7: Dr. Max Meis's visit to NTRL for assessment of bio-safety measures

Bio-safety officer training

From 14th – 16th September 2016, CTB conducted the "Training of Biosafety Officers for Laboratory Biorisk Management" in Yangon, attended by 23 participants (21 females and 2 males). The objective of this training was to build the capacity of lab technicians to serve as laboratory biosafety officers. This 3-day training introduced the latest principles of laboratory bio-risk management, assessment, mitigation and performance as formulated in the CEN Workshop Agreement CWA 15793 standard for laboratory bio-risk management. The WHO recommends the introduction of these principles for laboratory biosafety and biosecurity improvement.

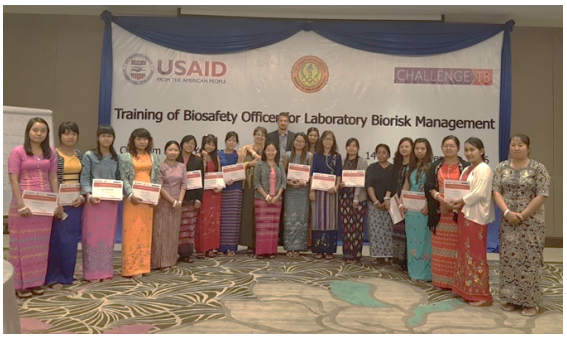

Figure 8: Group activities during "Training of Biosafety Officer for Laboratory Biorisk Management" and closing ceremony

As a result of this workshop, NTP was convinced about the need for a bio-safety officer and regular assessments for bio-risk in the labs. NTP has to nominate a biosafety officer very soon. CTB will support this NTP-nominated bio-safety officer by sending them to the international biosafety officer training workshop. Following this, the government biosafety officer and CTB lab team will jointly conduct risk assessments using the BioRAM software. The focus of this work will be to show laboratory staff why certain safety practices need to be implemented. Following these trainings, the CTB team will support and mentor staff about additional safety practices. The trained biosafety officer will then be expected to provide annual Bio-safety training in APA3.

#	Outcome Indicators	Baseline (Year/ timeframe)	Target	Result
			Y2	Y2
2.1.2	A current national TB laboratory operational plan exists and is used to prioritize, plan and implement interventions.	2 (Operational plan for TB diagnostic services (2016-2020) was developed during NSP development. NTP follows the plan.)	2	3
2.2.1	#/% of laboratories enrolled in EQA for smear microscopy	492/514 (96%) * Even though all 514 are enrolled in EQA, technicians were vacant in 22 site	100%	NA/516** The denominator expanded: 516 smear microscopy centers, numerator is yet to be available
2.2.2***	#/% of laboratories showing adequate performance in external quality assurance for smear microscopy	92%	93%	NA

2.2.6	Number and percent of TB reference laboratories (national and intermediate) within the country implementing a TB-specific quality improvement program i.e. Laboratory Quality Management System (LQMS).	0	1/3	0/3
2.2.7	Number of GLI-approved TB microscopy network standards met	5 (1,3,6,8,9)	7/11	7/11 (1,2,3,6,7,8,9)
2.3.1.	Percent of bacteriologically confirmed TB cases who are tested for drug resistance with a recorded result.	Not available		36% (17,603/48,825) *
2.4.3	MTB positivity rate of Xpert test results	39%	42%%	17692/41836 (42%) (denominator includes invalid, errors and no result)
2.4.5	% unsuccessful Xpert tests	NA	NA	5%
2.4.6	#/% of new TB cases diagnosed using GeneXpert	NA	NA	9410/128,290 (7.3%)
2.6.4	# of specimens transported for TB diagnostic services	NA	NA	N/A
2.7.1	#/% of laboratories implementing (internationally recommended) national biosafety standards (stratified by laboratories performing culture, DST and Xpert)	NA	NA	0/3

*Annual report on EQA for TB microscopy 2014, NTP, Sep 2015
** TB situation in Myanmar and response in line with DOTS, Stop TB strategy presentation by Director DC, 13 Oct, 2016
*** National Strategic Plan for TB 2016-2020, only percentage is available

Sub-objective 3. Patient-centered care and treatment

During APA2 CTB Burma supported:

- The process of decentralization of anti-retroviral therapy in TB treatment centers, to improve TB service provision for IDPs, cross-border migrants and people in hard-to-reach locations and ethnic areas; and
- Strengthening the capacity of national partners in PMDT and community-based DOTS.

Key Results

- In APA2, CTB-Burma successfully built strong working relationships with KDHW) from Kayin State in southeast Myanmar. KDHW is an ethnic health organization providing public health to local

people in the non-government controlled areas in Kayin State, Mon State and Bago (East) Region. Currently, KDHW provides approximately 100,000 people, including internally displaced persons (IDPs) from conflict areas with basic health services. In collaboration with KDHW, the CTB-Burma team provided TB training to 77 community health professionals from KDHW in two rounds of trainings. Training participants are now providing malaria and basic health care throughout 11 townships in Kayin State, Mon State, Tanintharyi Region and Bago (East) Region. CTB will continue to work closely with KDHW to build up the TB knowledge and skills of these community workers, so they can identify TB cases in the community where they are working and refer the cases to the nearest health facilities. In addition, CTB-Burma will continue to build linkages with TB diagnostic and treatment facilities to help increase TB testing and treatment access to these areas. CTB will continue to work with NTP and its TB partners to provide TB services to ethnic populations and hard-to-reach areas.

- During September 2016, CTB-Burma convened a partner meeting in Nay Pyi Taw with officials from MOHS, NTP, WHO, 3MDG and GF, and other TB implementing partners. This meeting focused on continued dialogue around:
    - Geographic and activity gaps in TB activities and MDR TB patient support package;
    - Partner mapping to avoid overlap of activities and funding opportunities for TB care in hard-to-reach areas and in the MDR-TB patient support of package
- As a result of this meeting, CTB-Burma will provide grants to partner organizations to conduct community based active case finding in hard-to-reach areas as well as the MDR TB patient support package. This work will include support for those in pre-enrollment stage and during treatment.
- The CTB-Burma team also provided TB and MDR TB technical support by offering multiple trainings to community volunteers at 43 townships in Yangon that are providing community-based PMDT (programmatic management of drug resistant TB). As a result of this successful work, work will be scaled up in the patient-centered community based MDR TB care model, developed by USAID CAP TB project by FHI 360, and currently implemented by Myanmar Medical Association (MMA), Myanmar Health Assistant Association (MHAA) and Pyi Gyi Khin (PGK) under the funding of 3MDG Fund. The trained community volunteers will provide evening DOTS, which will enhance adherence, infection control in the patients' home, contact screening and side-effect monitoring and referral, leading to an improved overall treatment success rate of MDR-TB patients. This package of support will be provided by CTB in APA3 in the areas in Myanmar other than Yangon and Mandalay, already implemented by 3MDG.
- In support of childhood TB prevention and care practice improvement in Myanmar, CTB-Burma, in collaboration with Prof. Steve Graham, updated the Childhood TB Treatment Guidelines, and developed accompanying training materials and tools. CTB also supported STTA by Professor Steve Graham to conduct Training of Trainer (TOT) for all regions/ states TB officers, pediatricians and TB focal persons from TB implementing partner organizations. CTB will continue organizing and supporting childhood TB cascade trainings in all states and regions across the country in APA3 with the goal of reaching state/regional and township level TB focal persons of the National TB Program (NTP).
- NTP is planning to facilitate the decentralization process of anti-retroviral therapy (ART) in TB treatment centers under the National TB Program in State/Regional, District and Township levels. CTB tracked the process of the TB/HIV collaborative expansion sites in coordination with both disease control programs (National TB Program and National AIDS Program) in APA2. Though CTB wasn't heavily involved in this activity, during the APA3 workplan meeting, the Director of Disease Control and NTP asked CTB to implement data strengthening activities for HIV/TB collaborating activities.

  As a result, CTB is supporting continued discussions between the two programs and to establish the technical team for data strengthening in implementing levels. CTB will also conduct the workshop at central level in APA3 including NTP, NAP, WHO and UNOPS (3MDG/ GF) to discuss reporting gaps and recording procedure improvement in township and district level collaboration and will also contribute to the follow up joint monitoring visits to provide necessary technical support.

#	Outcome Indicators	Baseline (Year/ timeframe)	Target	Result
			Y2	Y2
3.1.1.	Number and percent of cases notified by setting (i.e. private sector, pharmacies, prisons, etc.) and/or population (i.e. gender, children, miners, urban slums, etc.) and/or case finding approach	141,957	153,200	140,700 (87,545 males and 53,155 females) (128,290 new cases and 12,410 retreatment cases) NTP: 79.3% INGO: 1.9% PPM: PSI: 12.7% MMA: 2.4% PPM hospitals: 4%
3.1.4	Number of MDR-TB cases detected	National: 2,076 cases were diagnosed and notified as MDR TB. Among them, 1,537 cases started on treatment.	4063	2793
3.2.1	Number and percent of TB cases successfully treated (all forms) by setting (i.e. private sector, pharmacies, prisons, etc.) and/or by population (i.e. gender, children, miners, urban slums, etc.).	TSR - 85% (36,180/ 42,565) (2014 Report) - 2013 Cohort	85%	120,662/140,700=86%
3.2.4	Number of MDR-TB cases initiating second-line treatment	National: 2,076 cases were notified and diagnosed as MDR TB. Among them, 1,537 cases started on treatment. (2014)	4063	2207
3.2.7	Number and percent of MDR-TB cases successfully treated	79% (2014) [Cure 71% + Completed 8%]	81%	79% (526/666)
3.2.14	% of health facilities with integrated or collaborative TB and HIV services	41% (136/330)	71% (236/330)	100% (330/330)

Objective 2. Prevention

Sub-objective 4. Targeted screening for active TB

Under this sub-objective, CTB conducted activities within 2 intervention areas: (1) implement and monitor contact investigations; and (2) identify TB social determinants then develop, implement and monitor appropriate interventions.

Key Results

- CTB could not perform the agreed-upon activities related to contact investigation during APA2 due to NTP prioritization of other activities. Therefore, these activities have been pushed to APA3.
- Similarly, in regard to cost effectiveness of ACF approach, NTP requested CTB to provide technical assistance in APA3 only.

#	Outcome Indicators	Baseline (Year/ timeframe)	Target	Result
			Y2	Y2
4.1.2	#/% of children (under the age of five) who are contacts of bacteriologically-confirmed TB cases that are screened for TB	Not currently available when it will be available is not known.	Such data not available in the current RR system	553
4.2.1	Status of active case finding (0=no ACF policies or practices implemented; 1=policies or laws supporting ACF have been enacted; 2=ACF policy has been piloted/introduced in limited settings; 3=ACF policy implemented nationally)	No Baseline available yet but the country has tried to initiate ACF activities since 2013.	ACF Policy still being defined	~~4~~ 3

Sub-objective 5. Infection control

Under this sub-objective, CTB intended to conduct 2 intervention areas - (1) compliance with quality in health care, community and congregate settings ensured (2) TB surveillance among HCW ensured. Under this objective, CTB also planned to share the infection control assessment to NTP that was completed in APA1 and to analyze the current situation of congregate settings (e.g. mining settings, garment industry, IDP camps, etc.). It was intended that this assessment would inform revision of the National TB infection control manual, and that training materials would be updated. In addition, that a TB infection control TOT and cascade training would take place. ..

Key Results

- CTB assisted NTP in updating the National TB infection control manual and training materials, using the expertise provided by Dr. Max Meis, an Infection Control expert and consultant from KNCV. Then CTB organized an TB infection control TOT in May, 2016 and trained NTP officials from all states/regions, clinicians from TB specialist hospitals and TB focal person from partner organizations. After this TB infection control training, CTB will organize cascade trainings in all states/regions in APA3.
-

#	Outcome Indicators	Baseline (Year/ timeframe)	Target	Result
			Y2	Y2
5.1.2	#/% of health facilities implementing TB IC measures with Challenge TB support (stratified by TB and PMDT services)	Baseline is not available yet and it will be collected by Q4 Y1.	Target will be determined after NTP agrees to a roll-out plan. 45 Township Health Centers to be trained.	0/330 = 0%

5.2.3	Number and % of health care workers diagnosed with TB during reporting period	Not available	TBD	Not available

Objective 3. Strengthened TB Platforms

Sub-objective 7. Political commitment and leadership

CTB-Burma successfully supported the development, publication and dissemination of National Strategic Plan in APA2. Additionally, CTB-Burma was involved and technically assisted with developing the NSP budget and hence, completing a financial gap analysis and contributing to budget calculations for the Global Fund concept note, which were attributed under sub-objective 8.

Key Results

- The process of drafting the National TB Strategic Plan (2016-2020) began in May 2015. To assist with this, CTB-Burma provide NTP with technical assistance from consultant Christy Hanson. As the APA2 work plan starting being implemented, it was made very clear to the CTB leadership that finalizing the National TB Strategic Plan and updating the associated National TB Spending Assessment (NTSA) was the highest priority for the NTP. In order to be responsive and supportive to NTP, CTB Burma re-prioritized numerous activities so that CTB could help the NTP meet this time-sensitive, highly important target. A series of Technical and Strategic Group meetings took place to discuss development of NSP, in which CTB was involved. One CTB staff member worked closely with NTP and Christy Hanson, who worked remotely from the US. Christy also had a lot of discussion with NTP and focal person from various writing groups to get the final draft of NSP. Mr. Rick Homan, health economist from FHI360, also led the development of National TB Spending Assessment (NTSA) (2011-2014), which will be disseminated with NSP (2016-2020).
- CTB-Burma staff worked closely with NTP to get the approved NSP as well as M&E plan and NTSA (2011-2014), ready to be printed. The printed NSP, together with NATA and M&E Plan, will be disseminated on 13/10/2016 during the END-TB Strategy Launching Ceremony, funded by USAID/Challenge TB.

Figure 9: National TB Spending Assessment (2011-2014), National TB M&E Plan (2016-2020), and National TB Strategic Plan (2016-2020) (Full Version, Operation Plan and Concise version)

- CTB supported update/review of guidelines and job aides for infection control and childhood TB management and SOPs for use in the laboratories. These are included in their respective sub-objectives. CTB Burma staff were involved in the various steps in update/review of these documents – i.e. logistic arrangement for the meetings/workshops, hiring STTA for the specific

processes, etc. As a result, the country will have updated guidelines and updated SOPs for the laboratories which will help to ensure quality.

#	Outcome Indicators	Baseline (Year/ timeframe)	Target	Result
			Y2	Y2
7.1.1	% of the national TB strategic plan that is funded (from government funds, Global Fund grants, donors, etc.)	Baseline will be set in APA2 as soon as costing of TB NSP is completed	Target will be set after the baseline	GF grant process hasn't been finished yet. The budget breakdown will be updated with GF figures after that process.
7.1.2	Status of NSP development: 0=The NSP is expired or not being implemented; 1=An updated/new NSP is being drafted; 2=NSP has been developed and costed; 3=NSP has been finalized, endorsed by the government and implemented	1	3	3
7.2.3	% of activity budget covered by private sector cost share, by specific activity	Not available	TBD	Not applicable

Sub-objective 8. Comprehensive partnerships and informed community involvement

CTB-Burma Project had a constant discussion with GF PRs – UNOPS and SCI- and UNOPS/3MDG regarding support on infection control measures and bioengineering equipment maintenance. The Global Concept note was a priority for the NTP during APA2. Since it was associated with NSP, the NSP focal person from CTB was involved in the process of financial gap analysis, a crucial part in the development of the GF CN.

However, during this time, a National STOP TB Partnership was not established in the country. Challenge TB – Burma tried to propose the activities regarding the establishment of STOP TB Partnership in the APA3 proposal but this activity was not endorsed by the NTP as an APA3 priority.

- CTB-Burma supported PR-UNOPS (GF and 3MDG) and also PR-SCI (GF) with regards to infection control. One of the CTB staffs joined the assessment trip of SCI to 16 TB-care facilities from 6 states and regions. The assessment team comprised of an expert hired by SCI, an SCI staff and CTB-Burma staff. The lead consultant submitted a report to the NTP indicating the need for UVGI in some facilities, incorrect settings in health facilities for natural air flow and proper use of infection control equipment already existed in the facilities. NTP has not given any feedback yet.
- NSP was budgeted using WHO Planning and Budgeting Tool and 2 CTB staff were extensively involved in it. Consequently, those 2 staff were also involved in the financial gap analysis for Global Fund after getting the financial contributions from partner organizations to complete the NSP budget. CTB also financially supported one TSG meetings and one consultative workshop for the purpose of Global Fund Concept Note development.
- CTB-Burma also supported the hiring of a lead consultant for GF CN for the grant making process in September. During his consultancy period, he had meetings with NTP and Global Fund PRs

(UNOPS and SCI). As a result of discussion and his inputs, the TRP comments were properly addressed which were very important for the grant making process.

- In September, CTB team conducted a work planning meeting with NTP (which, in the future, will take place every quarter). The meeting took place in Nay Pyi taw and focused on future implementing activities from CTB and having a consensus among NTP, CTB and WHO stakeholders. The output of the meeting will certainly make CTB-Burma more productive in the upcoming APA3.

#	Outcome Indicators	Baseline (Year/ timeframe)	Target	Result
			Y2	Y2
8.1.3	Status of STOP TB Partnership	0	1	0
8.1.4	% of local partners' operating budget covered by diverse non-USG funding sources	Not available	0%	0%
8.2.1	Global Fund Grant rating	A1	A1	A2

Sub-objective 9. Drug and commodity management systems

CTB planned to support NTP with the development of a protocol for introducing new drugs. Additionally, CTB planned to organize workshops for SOPs, and M&E systems for the roll-out of new drugs. Finally, CTB-Burma planned to send NTP officials to TIME Modelling Training organized by London School of Tropical Hygiene and Medicine (LSTHM) as well as to visit the Vietnam NTP program on MDR-TB Clinical Management training.

Key Results

Due to other partners' activities CTB supported the redesign of activities under sub-objective 9 to instead organize a meeting with Johnson & Johnson to discuss their Bedaquiline donation program with USAID and other stakeholders. Additionally, CTB sent 4 NTP officials to attend MDR-TB Clinical Management training in Vietnam in September, 2016. The participants from Burma were 3 consultants from Yangon and Mandalay TB Hospitals and one regional TB officer. All four participants learnt what was happening with Vietnam regarding PMDT, which will be reflected in Burma in the clinical management of MDR-TB patients. New drug and regimen was also included in the training, which is important for the introduction of bedaquiline and delamanid in Burma.

LSHTM organized a training "TIME (TB Impact Modelling and Estimates) Modelling", which was aimed at using "TIME Impact" module in "Spectrum" Software. The training took place in 2 phases – the first one in Hanoi, Vietnam and the second, in Jakarta, Indonesia. It was attended by staff from NTP, KNCV and FHI360 in Vietnam, Indonesia and Burma. TIME can be used to plan TB health care services and estimate the cost-effectiveness of the planned and currently implementing TB control activities.

#	Outcome Indicators	Baseline (Year/ timeframe)	Target	Result
			Y2	Y2
9.1.1	Number of stock outs of anti-TB drugs, by type (first and second line) and level (ex, national, provincial, district)	0	N/A	0

9.2.1	# of new and ancillary drug regimens that have become available in country since the start of Challenge TB	0	2	2

Sub-objective 10. Quality data, surveillance and M&E

CTB Burma planned to support technical assistance activities related to strengthening 'a case or patient-based electronic recording and reporting system' starting from Year 2. But the timing of national e-health integration, led by HMIS department of Ministry of Health and Sports, did not happen in APA2 since CTB Burma's focus shifted to the NTP priority of completing the NSP and Concept note. Due to this, the majority of technical assistance for this sub-objective has been rescheduled to Year 3. Despite the delay, a series of discussions and efforts by CTB laid a good foundation for joint work plan development between NTP, USAID and CTB for the next fiscal year.

Key Results

Involvement in National strategy for e-Health integration

Though e-Health integration was a key aspect of the preceding CAP TB project, these activities haven't taken place under CTB.

Since the Ministry of Health and Sports is committed to using DHIS2 for e-Health transition, the National TB Program initiated activities to integrate DHIS2 into their HIS system. One technical staff of CTB project was trained in 'DHIS2 Fundamental course (DHIS2 Academy) and ToT training' by The Health Information Systems Programme (HISP) and University of Oslo. CTB Burma has already committed to participated in roll out of DHIS2 trainings for field implementation during APA3.

TB-HIV collaborative activities

CTB Burma worked closely with National AIDS Program (NAP) for TB-HIV activities including participating in DHIS2 trainings, organized by NAP. As a result, one technical staff from CTB-Burma was involved in the core DHIS2 trainer group focused on collaborative efforts for country-wide roll out of DHIS2 implementation.

Geographic Information System (GIS) and mapping activities

One GIS training was organized during Q4, with the local GIS expert from the project, for technical staff on the use of ArcGIS software to strengthen internal capacity. During the five-day training, CTB staff learnt what was GIS and how to produce a GIS-map using ArcGIS software, which will be useful for visualizing the mapping of TB control activities in Burma.

#	Outcome Indicators	Baseline (Year/ timeframe)	Target	Result
			Y2	Y2
10.1.4	Status of electronic recording and reporting system	0	NA	2
10.2.1	Standards and benchmarks to certify surveillance systems and vital registration for direct measurement of TB burden have been implemented	NA (1)	NA	No
10.2.6	% of operations research project funding provided to local partner (provide % for each OR project)	0	0	N/A

10.2.7	Operational research findings are used to change policy or practices (ex, change guidelines or implementation approach)	Not available	No	N/A

Sub-objective 11. Human resource development

CTB-Burma supported various international trainings for the NTP staff as well as internal capacity building for CTB staff.

Key Results

- CTB supported the 13 NTP officials to attend the following international trainings/ conference –
  - 2 NTP staff attending UNION conference in Cape Town
  - 4 NTP staff attending TIME Modelling training (2 during the first phase training in Vietnam and 2 during the second phase in Indonesia)
  - 4 NTP staff attending MDR-TB Clinical Management Training in Vietnam
  - 3 NTP staff attending laboratory workshop organized by PMU in The Hague, Netherlands.

11.1.3. Number of health care workers trained, by gender and technical area	**CTB APA 2**		**CTB APA 2 investment** **Moderate**
	# trained males APA 2	**# trained females APA 2**	**Total # trained in APA 2**
1. Enabling environment	**4**	**36**	**40**
2. Comprehensive, high quality diagnostics			**0**
3. Patient-centered care and treatment	**278**	**671**	**949**
4. Targeted screening for active TB			**0**
5. Infection control	**32**	**31**	**63**
6. Management of latent TB infection			**0**
7. Political commitment and leadership	**16**	**10**	**26**
8. Comprehensive partnerships and informed community involvement	**22**	**11**	**33**
9. Drug and commodity management systems			**0**
10. Quality data, surveillance and M&E			**0**
11. Human resource development			**0**
Grand Total	**352**	**759**	**1111**

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target	Result
				Y2	Y2
11.1.3	# of healthcare workers trained, by gender and technical area		0	1790	1,111 (352 males, 759 females)
11.1.5	% of USAID TB funding directed to local partners		0	7%	0%

4. Challenge TB Support to Global Fund Implementation

Current Global Fund TB Grants

TB NFM Grant covers the period of 01 January 2013- 31 December 2016 through two principal recipients Save the Children Foundation (SCF) and UNOPS.

Name of grant & principal recipient *(i.e., Tuberculosis NFM - MOHS)*	Average Rating*	Current Rating	Total Approved/Signed Amount**	Total Committed Amount	Total Disbursed to Date
TB NFM – 2013 – UNOPS	A2	B2	$80,633,776	$64,635,705	$51,803,296
TB NFM – 2013 – SCF	A1	A1	$18,914,228	$18,913,013	$13,982,917

In-country Global Fund status - key updates, current conditions, challenges and bottlenecks

This year, Burma was an early applicant for the next funding cycle of Global Fund (2018-2020). Burma submitted a joint TB/HIV Concept Note. Currently, TRP comments have been received by PRs and NTP. With the technical assistance by Dr. Holger Sawert, hired by CTB-Burma, the replies have been prepared and received consensus in the extended TB-TSG meeting in Nay Pyi Taw on 4/10/2016. The main areas to be addressed were childhood TB and phased introduction of short-course MDR-TB regimen, both addressed in the replies. Draft Performance Frameworks (PFs) as well as grant implementation budgets were developed by both PRs individually prior to the consultant's country visit and incorporated with consultant's input at later date. The Global Fund Country Team will visit Myanmar in October, though the date is not confirmed yet as of report writing.

Challenge TB involvement in GF support/implementation and any actions taken during Year 2

For the Save the Children Foundation (SCF) grant, CTB advised on opportunities for reprogramming underspent funds on TB-IC measures in clinics where sub-recipients are working in the country. After getting approval from reprogramming, SCF identified and hired an expert in the field of TB-IC who came to the country to conduct facility assessments, identify equipment needs, and ensure maintenance options are in place depending the identified needs (e.g. UVGI). The assessment trip was joined by a CTB staff to visit 16 facilities in six states/regions in the country.

Moreover, Challenge TB supported the GFATM and 3MDG projects by advising on such issues as:

- Advising on building layout, floor plan, construction design (CTB consultants have met UNOPS engineers to advise on these points);
- Equipment maintenance (Bio-Engineering);

- GUV procurement and installation (e.g. Advising on Quality Assured GUV fixtures to ensure those are included in tenders and supported linking the GFATM to a consultant who is providing specifications for GUV installation at the Aung San MDR-TB hospital);

5. Challenge TB Success Story

Training Basic Health Staff in KDHW: A step closer to TB control in Burma-Thai border

Burma has over half a million internally displaced people who have moved because of decades of internal conflict or to find work in the many mining areas in the country. A 2006 study suggested that nearly 58% these people delay seeking healthcare, because of social, economic and legal barriers.

On the eastern border of Burma in Karen State, public health care is conducted by the Karen Department of Health and Welfare (KDHW). The organization was established over 20 years ago to address the lack of health care resources in Karen State, an area where the government cannot deliver healthcare because of years of conflict. The KDHW is responsible for the public health issues of the approximately 100,000 people living in Karen State, where the security situation led many villagers to live in the jungle, where they are exposed to Malaria.

Challenge TB provided basic TB training to voluntary health workers working for the KDHW malaria control program in 11 townships in Mon State, Kayin State, Thanintharyi Region and East Bago region. The health workers who normally help those infected with Malaria, are now also on the lookout for those showing the signs and symptoms of TB. When they find any they direct them to the nearest health facility for diagnosis and treatment. They also teach people about infection control, and how to minimize transmission in homes and places where people gather. These health workers are now equipped to tackle two of the deadliest diseases in the country, and to bring help to where it is most needed.

Picture:
Left upper: Technical Officer from CTB leading the discussion during questions and answers session
Left and right lower: Training participants giving full attention to the lectures
Right upper: five participants from Lay Nyar Village

Childhood TB: What is the true burden?

It is estimated that more than one million children suffer from TB worldwide more than 140,000 die each year. A 2016 study estimated that 67 million children have latent TB, with about 850,000 developing active TB each year, but these numbers probably underestimate the true extent of the problem.

In 2013 the World Health Organization estimated that in Burma childhood TB is between 10-15% of all cases, but data national appeared to show that childhood TB accounted for nearly 25% of cases. The real picture is somewhere in between as many children below five years of age are not being diagnosed and some older children are being diagnosed with TB when in actual fact they are not infected. This of course raises concerns about diagnostic accuracy and practices in Burma, especially the use of chest X-ray.

In February 2016, the USAID funded Challenge TB project sent an external consultant to assess the status of childhood TB by conducting field visits and on the job training in Mon and Kayah States and the Bago region.

During the visit, he reviewed the TB treatment history of children, examined chest X-rays and did physical examinations in order to assess the accuracy of those diagnosed. He also conducted a series of workshops and trainings to review and update childhood TB treatment guidelines and enhance the quality of childhood TB care service delivered through the network of health care providers.

The most recent event was a Training of Trainers workshop which took place in September 2016. It was attended by 75 participants including pediatricians, NTP staff, NGO staff and senior technical

experts from 15 states/regions. After the trainings participants will conduct dissemination cascade trainings over the next few years.

Pictures
Left upper – The consultant checking the chest X-Ray of a child together with Regional TB Officer and NTP team leader
Left lower – Child on anti-TB treatment
Right – Reviewing the treatment history of a child on anti-TB medication

6. Operations Research

Title of OR study	Local partners involved in study	Implementation Status	Key findings	Dissemination
NO OR STUDY CONDUCTED BY CTB-BURMA IN APA2 PLANNED TO CONDUCT 3-4 OR IN APA3.				

7. Key Challenges during Implementation and Actions to Overcome Them

Challenge	Actions to overcome challenges
Technical	
Although external technical assistance was strong, the in-country technical focal point from the NTP was multi-tasked with various functions, which made it hard for CTB technical officers to coordinate with the NTP focal person for specific activities.	Satellite office and a senior consultant in Nay Pyi Taw will solve this problem to a certain extent as there will be a CTB focal person in NPT who can give considerably more time to discuss with the multi-tasked focal persons from NTP.
Data availability is very important for M&E technical officer (TO). The data from central NTP was limited in availability	The above solution will also help reduce the travels of M&E TO to a certain extent, although travel will be needed in the future for some specific data collection.
The spending rate of CTB in APA2 was low because activities were mostly technical assistance.	After thorough discussion with USAID, PMU and NTP, CTB will provide sub-grants to the local and international organizations working in Myanmar for TB control activities to speed up the spend rate in APA3, and simultaneously expand reach and impact of CTB-Burma.
Administrative	
Different locations of the NTP and CTB offices created delays in discussions and approval of some processes.	CTB-Burma plans to open a satellite office in Nay Pyi Taw, which will be staffed with one Senior Consultant and one Administrative Assistant
Several planned activities in the approved APA2 annual work plan were not implemented. This was due to a number of unforeseen circumstances such as: natural disasters (e.g., unprecedented flooding at the beginning of APA 2) that required MOHS to redirect staffing to focus on addressing the disasters; communication delays between partners, and lack of access to national level data regarding TB prevalence, case detection; and the diagnosis gap throughout all areas of Myanmar. Additionally, during APA2, NTP and stakeholder efforts were heavily focused on finalization of the NSP which was a time-intensive process and required that NTP staff be reallocated from some planned CTB activities to focus on completion of the NSP. Once the magnitude of this priority shift was realized, the CTB team worked to realign their efforts to support the NTP	Regular quarterly workplan meetings at NTP office with NTP and necessary stakeholders to avoid overlapping and to have consensus regarding the proposed activities. The proper discussion during those meetings will help CTB progress with the consensus from important national stakeholders.
The NTP had insufficient staff in the central level. Even though there were assigned	One deputy director from another department is attached to NTP and one AD came back from her

assistant directors (AD) at the central level, NTP employees continued to have heavy workload. Two AD positions (out of four) were vacant in central NTP in APA2.	study abroad for one year (for her thesis). Three more medical officers appointed in APA2 have been assigned tasks. In APA3, the NTP will have more staff than APA2 and CTB will work to better communicate with NTP regarding implementation of activities.
Difficulty in having access to some national data: This is in part because there is no existing ERR system and the way data is currently collected does not allow for disaggregation of data that might be useful to guide decision making.	CHAI is initiating the ERR system for MDR-TB patients using open MRS and also for the HIV system. CTB in APA3 will assist in and ensure the installation of GxAlert in all GeneXpert machines being operated in the country. One Technical Officer (M&E) will keep involved in the series of meetings to develop the DHIS II.

8. Lessons Learned/ Next Steps

Implementation of the Challenge TB Project is projected to keep the same technical direction for the third year of the project while the follow-on and remaining activities from APA2 will be implemented with better effort. A National level focus of activities will be maintained, while specific geographic areas for numerous activities are still being defined. Activities such as supporting PMDT decentralization (with support package to the on-treatment MDR-TB patients), community-based TB care and drug seller PPM expansion are expected to happen in selected geographic areas in the country.

The biggest lesson learned during APA2 related to organizing communications with both the NTP Director (Dr. Si Thu Aung) and the Director of Disease Control (Dr. Thandar Lwin – Former NTP Director). The project has learned that communications must involve both parties in order to have activities approved. To address this issue, the project tried to communicate with both individuals but the time availability is limited for both. CTB didn't have a focal person sitting in the capital who could quickly have a meeting with them, either. Therefore, CTB finally decided to have a satellite office in Nay Pyi Taw, with a Senior Consultant based in the new office.

The high level of communications will need to be maintained not only in regards to gaining approval to conduct activities, site visits, and to meet partners but also in regards to the design of the planned activities. Review of the APA2 work plan have revealed numerous areas where strategic discussions are still needed with our national counterparts (e.g. For PPM activities, it is clear that the MoH has ideas where they would like to support the public-public mix but that such a strategy for private hospitals is not in place, while PPM expansion in private hospitals is an important issue to address).

The number of key staff in Central NTP was limited during the period of APA2. When it came to emergency response in the country (such as measles outbreak in remote Naga area), the already limited staff within the government were repurposed to support the emergency response activities. On top of this, the CTB-Burma team at times would need to communicate with these individuals to plan for specific activities. However, if the focal was tasked to another critical assignment, CTB wasn't able to communicate with the individual which resulted in delayed activity implementation. Central NTP has its full structure again at the moment and it is expected that the CTB-Burma satellite office in Nay Pyi Taw will also solve this problem to a certain extent.

It was difficult to access to the national data, consuming a lot of time and, sometimes necessitating personal travel to the capital. This challenge was compounded in part due to lack of an eR&R system covering the whole country. CHAI is initiating the ERR system for MDR-TB patients using open MRS and also for the HIV system. CTB in APA3 will assist in and ensure the installation of GxAlert in all GeneXpert machines being operated in the country. One Technical Officer (M&E) will keep involving in the series of meetings to develop the DHIS II. CTB will also assist in the establishment a small group of monitoring team that will enable the data quality from TB/HIV collaboration sites, after having field visits to those sites.

One positive lesson has been that once an activity is established and the NTP and Disease Director like the results, in such cases accelerated approval of activities and external assistance will be possible. The NSP process is an excellent example of such a situation.

Annex I: Year 2 Results on Mandatory Indicators as well as National Data on the Number of pre-/XDR-TB Cases Started on Bedaquiline or Delamanid

MANDATORY Indicators

2.1.2 A current national TB laboratory operational plan exists and is used to prioritize, plan and implement interventions.	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Score as of September 30, 2016	3	N/A	**Moderate**	Current laboratory operational plan was developed, part of which was based on Kathleen England's report.
2.2.6 Number and percent of TB reference laboratories (national and intermediate) within the country implementing a TB-specific quality improvement program i.e. Laboratory Quality Management System	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Number and percent as of September 30, 2016	0% (0/3)	N/A	**Moderate**	CTB supported organising the LQMS introduction workshop, GeneXpert Training based on GLI package and Biosafety Officer training in September, 2016.
2.2.7 Number of GLI-approved TB microscopy network standards met	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Number of standards met as of September 30, 2016	7 out of 11 (1,2,3,6,7,8,9)	N/A	**None**	
2.3.1 Percent of bacteriologically confirmed TB cases who are tested for drug resistance with a recorded result.	**National 2015**	**CTB 2015**	**CTB APA 2 investment**	**Additional Information/Comments**

Percent (new cases), include numerator/denominator	22.3% (9,410/42,172)	N/A	**Moderate**	The numbers in column B actually have "number of tests" in the numerator, but "number of cases/individuals" in the denominator. Since some people had confirmatory testing done, the percentage may not be reflective of the actual situation. This is how retreatment percentage is >100%. Data on individuals tested by GXP is not available. GXP data comes from the GXP focal (mentioning the number of tests done) and the number of retreatment cases from national data collection for TB-07 form (mentioning the number of individuals).
Percent (previously treated cases), include numerator/denominator	115.2% (7,665 tests/6,653 cases)	N/A		
Percent (total cases), include numerator/denominator	17,603/48,825 = 36%	N/A		
3.1.1. Number and percent of cases notified by setting (i.e. private sector, pharmacies, prisons, etc.) and/or population (i.e. gender, children, miners, urban slums, etc.) and/or case finding approach	**National APA2**	**CTB APA2**	**CTB APA 2 investment**	**Additional Information/Comments**
Number and percent	*140700 (2015)*	*NA*		
3.1.4. Number of RR-TB or MDR-TB cases notified	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Total 2015	2793	N/A	**None**	
Jan-Mar 2016	755	N/A		
Apr-June 2016	708	N/A		
Jul-Sept 2016	U	N/A		
To date in 2016	1463	0		

3.2.1. Number and percent of TB cases successfully treated (all forms) by setting (i.e. private sector, pharmacies, prisons, etc.) and/or by population (i.e. gender, children, miners, urban slums, etc.).	**National 2014 cohort**	**CTB 2014 cohort**	**CTB APA 2 investment**	**Additional Information/Comments**
Number and percent of TB cases sucessfully treated in a calendar year cohort	Getting from WHO	N/A	**None**	No previous CTB investment
3.2.4. Number of patients started on MDR-TB treatment	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Total 2015	2207	N/A	**None**	
Jan-Mar 2016	500	N/A		
Apr-June 2016	621	N/A		
Jul-Sept 2016	U	N/A		
To date in 2016	1121	0		
3.2.7. Number and percent of MDR-TB cases successfully treated	**National 2013 cohort**	**CTB 2013 cohort**	**CTB APA 2 investment**	**Additional Information/Comments**
Number and percent of MDR-TB cases successfully treated in a calendar year cohort	Getting from WHO	N/A	**None**	
5.2.3. Number and % of health care workers diagnosed with TB during reporting period	**National 2015**	**CTB 2015**	**CTB APA 2 investment**	**Additional Information/Comments**
Number and percent reported annually	U	U	**None**	
6.1.11. Number of children under the age of 5 years who initiate IPT	**National 2015**	**CTB 2015**	**CTB APA 2 investment**	**Additional Information/Comments**
Number reported annually	553	N/A	**Limited**	Technical inputs to the paediatric TB treatment guideline was given by CTB expert Dr. Steve Graham.

7.2.3. % of activity budget covered by private sector cost share, by specific activity	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Percent as of September 30, 2016 (include numerator/denominator)		N/A	**None**	
8.1.3. Status of National Stop TB Partnerships	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Score as of September 30, 2016	0		**None**	STOP TB partnership was not established yet in the country.
8.1.4. % of local partners' operating budget covered by diverse non-USG funding sources	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Percent as of September 30, 2016 (include numerator/denominator)		N/A	**None**	
8.2.1. Global Fund grant rating	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Score as of September 30, 2016	A2		**Limited**	CTB supported the Global Fund PRs in contsruction design and assessment regarding infection control procedures.
9.1.1. Number of stock outs of anti-TB drugs, by type (first and second line) and level (ex, national, provincial, district)	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Number as of September 30, 2016	**0**		**None**	

10.1.4. Status of electronic recording and reporting system	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Score as of September 30, 2016	2		**None**	QuanTB, mSupply, OpenMRS, DHISII and GxAlert for forecasting, LMIS, MDR-TB, aggregated DS-TB and GeneXpert respectively
10.2.1. Standards and benchmarks to certify surveillance systems and vital registration for direct measurement of TB burden have been implemented	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Yes or No as of September 30, 2016	No		**None**	Conducted in 2014 Met: B1.1, B1.2, B2.1, Partially: B.3, B1.7
10.2.6. % of operations research project funding provided to local partner (provide % for each OR project)	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Percent as of September 30, 2016 (include numerator/denominator)		N/A	**None**	
10.2.7. Operational research findings are used to change policy or practices (ex, change guidelines or implementation approach)	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Yes or No as of September 30, 2016		N/A	**None**	

11.1.3. Number of health care workers trained, by gender and technical area	CTB APA 2		CTB APA 2 investment	Additional Information/Comments
			Moderate	
	# trained males APA 2	# trained females APA 2	Total # trained in APA 2	Total # planned trainees in APA 2
1. Enabling environment	4	36	40	1200
2. Comprehensive, high quality diagnostics			0	120
3. Patient-centered care and treatment	278	671	949	110
4. Targeted screening for active TB			0	0
5. Infection control	32	31	63	165
6. Management of latent TB infection			0	N/A
7. Political commitment and leadership	16	10	26	0
8. Comprehensive partnerships and informed community involvement	22	11	33	0
9. Drug and commodity management systems			0	N/A
10. Quality data, surveillance and M&E			0	N/A
11. Human resource development			0	N/A
Other (explain)			0	N/A
Other (explain)			0	N/A
Grand Total	352	759	1111	1595

11.1.5. % of USAID TB funding directed to local partners	National APA 2	CTB APA 2	CTB APA 2 investment	Additional Information/Comments
Percent as of September 30, 2016 (include numerator/denominator)	N/A	N/A	**None**	Subcontracts were planned but it was cancelled after MOT in August 2016.

Year/Quarter	Number of pre-/XDR-TB cases started on BDQ nationwide	Number of pre-/XDR-TB cases started on DLM nationwide	CTB APA 2 investment	Additional Information/Comments
Total 2014	0	0	**Limited**	END-TB Project is a project run by MSF-OCA in Myanmar and is providing XDR-TB treatment in Burma. All BDQ cases were treated by NTP and all DLM cases, by END-TB Project so far.
Total 2015	0	0		
Jan-Mar 2016	1	1		
Apr-Jun 2016	3	2		
Jul-Aug 2016	4	2		
To date in 2016	8	5		

Number and percent of cases notified by setting (i.e. private sector, prisons, etc.) and/or population (i.e. gender, children, miners, urban slums, etc.) and/or case finding approach (CI/ACF/ICF) (3.1.1)							
		Reporting period					**CTB APA 2 investment**
		Oct-Dec 2015	Jan-Mar 2016	Apr-Jun 2016	Jul-Sept 2016	Cumulative Year 2	
Overall CTB geographic areas	TB cases (all forms) notified per CTB geographic area *(List each CTB area below - i.e. Province name)*						
	National						

	National						
	National						
	National						
	National						
	National						
	National						
	National						
	TB cases (all forms) notified for all CTB areas						
	All TB cases (all forms) notified nationwide (denominator)	34,487	31,769	34,100	U		
	% of national cases notified in CTB geographic areas						
Intervention (setting/population/approach)							
Other (specify)	CTB geographic focus for this intervention						
	TB cases (all forms) notified from this intervention						
	All TB cases notified in this CTB area (denominator)						
	% of cases notified from this intervention						

Annex II: Status of EMMP activities

Environmental Mitigation and Monitoring Plan for CTB-Burma has been approved for Year2-5.

Year 2 Mitigation Measures	Status of Mitigation Measures	Outstanding issues to address in Year 3	Additional Remarks
Education, technical assistance and training about activities that inherently affect the environment include discussion prevention and mitigation of potential negative environmental effects.	N/A	N/A	
Technical assistance and training about how to operate public health commodities, maintain them, and properly dispose of them, if/when no longer functional.	CTB hasn't procured the planned thermos-anemometers, UV meters, fit test kits and vaneometers for the purpose of training	N/A	
For health facilities being supported by CTB, the project will obtain the country's non-medical and medical waste management regulations and procedures. CTB will support training in clinical waste management and ensure that it is integrated into training programs and NTP guidelines. Training material will align with national regulations and procedures for medical wastes. During supportive supervision	Bio-risk management training was given, which will be associated with mitigation of environmental impacts. CTB experts also suggested for the proper handling, storage and disposal of medical wastes and biological specimens during their visits to the facilities.	N/A	

visits, management and disposal of medical waste will be discussed and checked; when necessary, corrections will be made.			